

$$1.) \quad 7 + 13(x+1) \leq 3x$$

$$7 + 13x + 13 \leq 3x$$

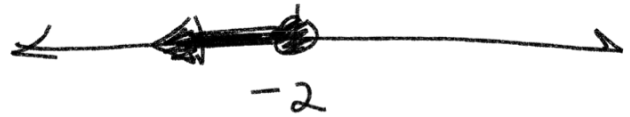
$$13x + 20 \leq 3x$$

$$\begin{array}{r} -13x \\ -13x \end{array}$$

$$\frac{20}{-10} \leq \frac{-10x}{-10}$$

$$\boxed{-2 \geq x}$$

$$\boxed{x \leq -2}$$



$$2.) \quad 3x - 5 \geq -8 \quad \text{and} \quad 3x - 5 \leq 1$$

$$\begin{array}{r} +5 \\ +5 \end{array}$$

Converge

$$\begin{array}{r} +5 \\ +5 \end{array}$$

$$\frac{3x}{3} \geq \frac{-3}{3}$$

$$\boxed{x \geq -1}$$

$$\frac{3x}{3} \leq \frac{6}{3}$$

$$x \leq 2$$



$$3.) \quad 16 > 3x + 1 \geq -8$$

$$\begin{array}{r} -1 \\ -1 \\ -1 \end{array}$$

$$\frac{15}{3} > \frac{3x}{3} \geq \frac{-9}{3}$$

$$\boxed{5 > x \geq -3}$$

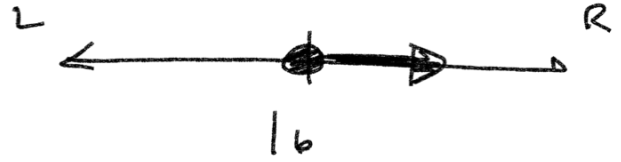


$$1.) \quad 10 - x \geq -2(3+x)$$

$$10 - x \geq -6 - 2x$$

$\begin{array}{ccc} +2x & & +2x \end{array}$

$$\begin{array}{ccc} 10 + x \geq -6 & & x \geq -16 \\ -10 & & -10 \end{array}$$



$$2.) \quad \frac{2(x-1)}{2} < \frac{-4}{2} \quad \text{or} \quad 2(x-1) > 4$$

$$x-1 < -2$$

$$\begin{array}{ccc} +1 & & +1 \\ \hline x < -1 \end{array}$$

$$2x - 2 > 4$$

$\begin{array}{ccc} +2 & & +2 \end{array}$

$$\frac{2x}{2} > \frac{6}{2}$$

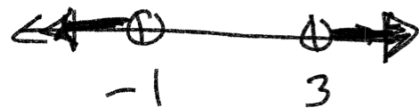
$$x > 3$$

$$3.) \quad -10 \leq \boxed{4x+2} \leq 10$$

$\begin{array}{ccc} -2 & & -2 \end{array}$

$$\frac{-12}{4} \leq \frac{4x}{4} \leq \frac{8}{4}$$

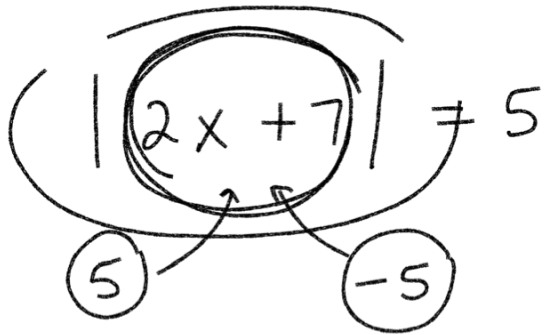
$$-3 \leq x \leq 2$$



Absolute Value - distance from a number to zero on the number line

$$|5| = 5$$

$$|-5| = 5$$



$$\begin{cases} 2x + 7 = 5 \\ -7 \quad -7 \end{cases}$$

$$\frac{2x}{2} = \frac{-2}{2}$$

$$\boxed{x = -1}$$

$$\begin{cases} 2x + 7 = -5 \\ -7 \quad -7 \end{cases}$$

$$\frac{2x}{2} = \frac{-12}{2}$$

$$\boxed{x = -6}$$

$$\boxed{|x - 3| = -1}$$

An arrow points to the right side of the equation, indicating that an absolute value cannot be equal to a negative number.

No solution

$$|2x + 7| = 5$$

$$|-12 + 7| = 5$$

$$|-5| = 5 \quad \checkmark$$

ns

$$|x+7| = \underline{2x+8}$$

$$\begin{array}{r} x+7 = 2x+8 \\ -7 \quad -7 \end{array}$$

$$\begin{array}{r} x = 2x + 1 \\ -2x \quad -2x \end{array}$$

$$\begin{array}{r} -x = 1 \\ \frac{-x}{-1} = \frac{1}{-1} \end{array}$$

$$\boxed{x = -1}$$

$$\begin{array}{l} 2x+8 \\ 2(-1)+8 \\ -2+8 = 6 \end{array}$$

$$x+7 = -(2x+8)$$

$$\begin{array}{r} x+7 = -2x-8 \\ +8 \quad +8 \end{array}$$

$$\begin{array}{r} x+15 = -2x \\ -x \quad -x \end{array}$$

$$\begin{array}{r} 15 = -3x \\ \frac{15}{-3} = \frac{-3x}{-3} \end{array}$$

~~$$\boxed{x = -5}$$~~

~~$$\begin{array}{l} 2x+8 \\ 2(-5)+8 \\ -10+8 = -2 \end{array}$$~~

*

$$\begin{array}{r} -3 | x+4 | = \frac{-12}{-3} \\ \hline -3 \end{array}$$

$$\sum_2 |x+4| = 4$$

No "x"
No need to check!

$$\begin{array}{r} x+4 = 4 \\ -4 \quad -4 \end{array}$$

$$\boxed{x = 0}$$

$$\begin{array}{r} x+4 = -4 \\ -4 \quad -4 \end{array}$$

$$\boxed{x = -8}$$

$$|3x + 15| + 8 = 6$$

-8 -8

1st Step: Always isolate absolute value

$$|3x + 15| = -2$$

No solution

$$|5x - 1| + 7 = 3x$$

-7 -7

$$-|-4| = -4$$

= -4

$$|5x - 1| = 3x - 7$$

there's an "x"

$$5x - 1 = 3x - 7$$

-3x -3x

$$2x - 1 = -7$$

+1 +1

$$\frac{2x}{2} = \frac{-6}{2}$$

$$x = -3$$

say this

$$3x - 7$$

$$3(-3) - 7$$

$$-9 - 7 = -16$$

$$5x - 1 = -(3x - 7)$$

$$5x - 1 = -3x + 7$$

+3x +3x

$$8x - 1 = 7$$

+1 +1

$$\frac{8x}{8} = \frac{8}{8}$$

$$x = 1$$

$$3(1) - 7$$

$$3 - 7 = -4$$

No solution!

$$|x + 5| > 12$$

take negative
and
flip inequality

$$x + 5 > 12$$

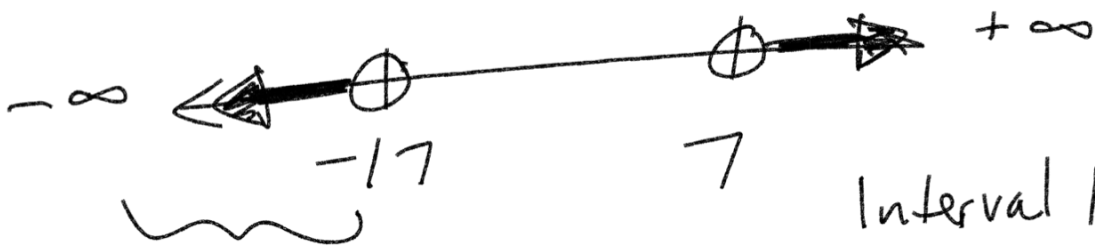
-5 -5

$$x > 7$$

$$x + 5 < -12$$

-5 -5

$$x < -17$$



$$(-\infty, -17) \cup (7, \infty)$$